

billing attributes stored locally in their processors. This allows device-specific attributes to be added to the device itself. The billing manager 4 stores these attributes and substitutes the new device-specific attributes for the previous attributes.

The billing system software 8 is coupled to the billing manager 4 by either a direct or wireless connection. This billing system software 8 is preferably a traditional back-end billing system that manages the billing transactions themselves. This could be a settlement service on the Internet or an Enterprise accounting system. These systems are well known in the art and will be discussed with more detail later. The billing system software 8 is connected to the accounts record database 10. The account records database 10 stores the billing data as a result of the printing transactions. Also, as will be discussed with regards to FIGS. 3 and 4, the account records database 10 stores the current token levels for each user and charge account information for periodic token billing resolution.

The billing system software 8 allows for the configuration of any printer device 12 directly with billing polices and allows a user to access those devices based in accordance with the billing polices. The system includes a network of printer devices 12 electronically interconnected via a network (not shown). The network could consist of a business, plurality of business or devices in a public area, such as an airport or library.

A typical scenario for billing a particular print job is illustrated in FIG. 2. Initially, as shown in block 100, the user accesses the print device 12. Typically, this is carried-out as the user indicating that a printing operation is desired. The user connects to a selected printer device 12 via a mobile access device 14 or a personal computer system and indicates that there is a document or document reference which is to be printed at the printer device 12. There are various ways in which the mobile access device 14 connects to the printer device 12. First, there can be a terminal or physical connection between the devices. Second, there can be wireless access to the network, for example, using known techniques like Motorola's Bluetooth™ technology or the wireless LAN standard 802.11(b). Third, the mobile access device 14 can be connected to the printer device 12 via an infrared signal. These techniques are well known in the art.

Once the user has initiated contact with the printer device 12, as shown in block 110, the printer device 12 connects to the billing manager 4. Once the mobile access unit 14 establishes communication with the printer device 12, the printer device 12 connects to the network (not shown), allowing the user to communicate with the billing manager 4. Subsequently, the printer device 12 is connected to the billing manager 4, and the billing manager 4 prompts the user to input user credentials to authorize user access to the network as shown in block 120. User credentials can be credit card information, a digital signature, an account code, a digital certificate or user name or the like.

At block 130, the user transmits user credentials to the billing manager 4 from the mobile access unit 14. The billing manager 4 determines whether the received credentials correspond to the credentials stored in memory for this particular user as shown at block 3. If the credentials are different, then as shown in block, 210, the user is denied access to the system. If the transmitted credentials correspond, then the document to be printed or document reference is transmitted from the mobile access unit 14 to the billing manager 4. The billing manager 4 retrieves from its memory a list of all the available printer devices 12. The user then selects the printer device 12 to which the document is to be printed. The billing manager retrieves the billing policies for that printer, as shown in block 150. The billing policies are stored in the billing policies database 6.

The billing policies can be any payment mode or plan, such as whether the cost of printing is free or a specific cost per page or whether the printing is free for certain users. The billing policies are retrieved from the billing policies database 6 and stored at the billing manager 4. One of ordinary skill can easily recognize that this list is not exhaustive of the possible combinations of billing policies that can be implemented, but only an illustrative few. The policies are determined at the system initialization and stored in the database 6. If for example, a user or printer device 12 was new to system or the characteristics of a pre-existing user have changed, then a system administrator would input the new billing characteristics of the user or device into the initial setup unit 16, which could then update the billing policy database 6.

The billing manager 4 would determine whether there is a charge for printing requested by the user in block 160. If there is not, the document is sent to the printer. If there is, then the

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5 billing manager 4 transmits the computed charges to the user, as shown in block 160. The mobile access unit 14 receives the transmission from the billing manager 4 and displaying the printing fees, as shown in block 170. The billing manager 4 transmits the fee to the mobile access unit 14. Once the fees have been displayed to the user, the system prompts the user as to whether to accept the charges, as shown in block 170. If the charges are accepted, then the document is retrieved from the memory of the billing manager 4 or the document is retrieved from the location specified in the document reference and transmitted to the specified printer device 12, as shown in block 180. However, if the charges are not accepted, then the user is denied access (not shown). The charges themselves will be explained in further detail with regards to FIG. 3.

10 The document is then printed at the printed device 12, in accordance with the specifications indicated by the user.

In block 190, the billing manager 4 determines if there is billing required for the completed printing operation. If there is no billing required, this means the printing was performed for no cost and then the operation is concluded. If there is billing required, then the billing information is determined and transmitted to back office system software 8 as shown in block 200. For example, the billing manager 4 would determine that a specific user printed a document consisting of 4 sheets of paper at 10 cents each and send that information to the back office billing system software 8, which processes the information. As stated above, the back office billing system software 8 can be a settlement service on the Internet or an Enterprise accounting system. Both systems are well known in the art. The back office billing system software 8 reconciles the present transaction with the user's account and updates the user's account information in the account records database 10.

25 The system of a preferred embodiment uses tokens as an arbitrary measure of the usage of the printer devices. The tokens represent the costs of predetermined printing operations. In a preferred embodiment, the tokens have no monetary value. However, one of ordinary skill in the art can envision an embodiment of the invention in which the tokens are of a form of electronic currency.

The billing system transactions are shown in FIG. 3. In block 300, the billing manager 4 accesses the back office billing system software 8 to retrieve a users token balance from the